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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/037,341

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David Baltimore

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EXAMINER

GUZO, DAVID

ART UNIT

PAPER NUMBER

1636

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

04/19/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/037,341	BALTIMORE ET AL.	
	Examiner	Art Unit	
	David Guzo	1636	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 and 32-90 is/are pending in the application.
- 4a) Of the above claim(s) 1-30, 32-65 and 74-88 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 66-73, 89 and 90 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 January 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. <u>1/11/07</u> |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

This Office Action is in response to applicants' submission on 1/22/07. In said submission, applicants indicate that in their 9/28/06 response to the restriction requirement mailed 3/28/06, they explicitly requested that at least claims 89 and 90 be examined and that said claims appeared to be in Group XXIV. Applicants request that claims 89 and 90 be examined.

In response, the examiner notes that claims 89 and 90 will be rejoined with Group XXIV and will be examined. The previous Office Action included an examination of claims 66-73 (Group XXIV). The following Office Action will include an examination of Claims 66-73 and claims 89-90. Any inconvenience or confusion this oversight may have caused applicants is sincerely regretted.

Applicant's election with traverse of Group XXIV, Claims 66-73 and 89-90 in the reply filed on 9/28/06 and 1/22/07 is acknowledged. The examiner's response to applicants' traverse of the restriction requirement was contained in the Office Action mailed 1/4/07 and will not be repeated here.

The requirement is still deemed proper and is therefore made FINAL.

Claims 1-30, 32-65 and 74-88 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 10/2/06.

Priority

Priority for the claimed subject matter in claims 66-68, 70 and 89-90 is granted back to the filing date of the 07/341,436 ('436) application (4/21/1989). Priority for the subject matter of claim 69 (method of enhancing NF-kB) is granted back to the filing date of the 06/946,365 ('365) application (12/24/1986). Priority for the subject matter of claims 71-73 is granted back to the filing date of the 07/791,898 ('898) application (11/13/1991).

No application filed prior to the 07/341,436 application discloses a method of regulating (which reads on increasing **or inhibiting**) NF-kB mediated gene expression in a cell, comprising altering NF-kB activity in the cell. Applications prior to the '436 application recite methods of inducing or increasing NF-kB activity in cells but do not recite methods of inhibiting or decreasing NF-kB activity in cells. The subject matter of claim 69 is first disclosed in the '365 application, the prior application does not disclose the claimed method of enhancing NF-kB activity in **any cell** (as is currently claimed). With regard to claims 71-73, applications prior to the '898 application do not provide an enabling disclosure (or provide a written description) of expression systems comprising a binding site for NF-kB operably linked to a promoter and gene of interest and culturing the cells under conditions for expressing any gene in any cell. With regard to the binding site consensus sequence recited in claim 72 and the list of sequences comprising said consensus sequence recited in claim 73, these limitations were first disclosed in the '436 application.

35 USC 101 Rejections

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 66-70 and 89-90 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claims processes read on naturally occurring cellular processes in the body. The levels and activity of NF- κ B are regulated (Increased or decreased) by normal metabolic processes (i.e. processes involved in natural digestion of food or consumption of alcohol, etc.) and the function of NF- κ B to act as an intracellular messenger to transmit signals that induce expression of target genes is likewise a natural process in cells of the human body. The instant claims therefore read on naturally occurring phenomena which do not recite, or require, the hand of man (See MPEP 2106).

35 USC 102 Rejections

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 66-68, 70 and 89-90 are rejected under 35 U.S.C. 102(b) as being anticipated by the Physician's Desk Reference (PDR: 1985) pages 1811-13; Griffith I

(Griffith et al., Ann. Surg. 196 (9/82): 324-329) or Griffith II (Griffith et al., J. Thorac. Cardiovasc. Surg. 99 (12/84): 952-957) as evidenced by Holschermann et al., Circulation 96 (12/97) 4232-4238.

Applicants claim a method of regulating NF- κ B-mediated gene expression in a cell, comprising altering NF-KB activity in the cell and a method of regulating transduction in a cell of an extracellular signal by NF- κ B, comprising altering NF- κ B activity in the cell, wherein NF- κ B activity is reduced. Applicants also claim a method of regulating NF- κ B-mediated expression of a selected gene in a cell, comprising introducing into the cell a substance which regulates NF- κ B activity in the cell. With regard to claims 89-90, applicants claim a method for reducing expression in a human cell of a gene, the expression of which has been induced by an external influence that activates NF-kB to act as an intracellular messenger to transmit a signal that induces expression of the gene from the plasma membrane of the cell to the nucleus of the cell, which method comprises within the cell inhibiting transmission of the signal so as to thereby reduce expression of the gene in the cell.

PDR (1985), Griffith I and, Griffith II teach administration of cyclosporin A (CsA) to (into) cells in cardiac patients, which is shown from the teaching of Holschermann, to inherently regulate (reduce) NF- κ B activity and thus would inhibit (reduce) expression of genes whose transcription is regulated by NF- κ B activity or regulate transduction in the cell of an extracellular signal by NF- κ B since NF- κ B activity is altered (reduced) as an effect of administration of CsA. The inhibition is done by reducing binding of NF- κ B to NF- κ B recognition sites, which also decreases the level of NF- κ B not bound in a NF- κ B

- I κ B complex, inhibiting the passage of NF- κ B into the nucleus of cells, inhibiting modification of an I κ B protein, and inhibiting degradation of an I κ B protein.

Specifically, the PDR 1985 reference teaches that CsA should be administered before and after surgery for 1-2 weeks at a dose of about 15 mg/kg/d, followed by a decrease of 5% per week to a final level of 5-10 mg/kg/day (see p. 1813). When monitoring whole blood levels, a 24-hour trough value of 250-800 ng/ml CsA appeared to minimize side effects and rejection effects. Griffith I reports the administration of 5-10 mg/kg/d of CsA (average 8 mg/kg/d) (See Abstract); while Griffith II reports the administration of 2-30 mg/kg/d (average 7.5--8 mg/kg/d) (See Abstract) to obtain a targeted blood level of CsA of about 1000ng/ml.

Holschermann provides extrinsic evidence that the PDR 1985, Griffith I, and Griffith II references inherently anticipate the subject claims. Holschermann essentially repeated the tests disclosed in the Griffith I and II references by administering 3.4 ± 0.3 mg/kg/day CsA to cardiac transplant patients, resulting in blood levels of 681 ± 176 ng/ml (See p. 4233). PBM cells were isolated from the blood of the patients before and after CsA therapy, and nuclear extracts from the cells were prepared. Holschermann then conducted an EMSA assay using nuclear extracts (see Figure 4) which is the same assay format taught by applicants for determining whether compounds (i) reduce NF- κ B activity and (ii) reduce binding of NF- κ B to NF- κ B recognition sites. Holschermann confirms that administering CsA to cardiac patients as taught by the prior art PDR 1985 and Griffith I and II references necessarily inherently reduces NF- κ B activity (and binding of NF- κ B to NF- κ B recognition sites). In cells obtained from transplant

Art Unit: 1636

recipients during low baseline CsA blood levels (before CsA administration), strong NF- κ B binding activity was detected (Fig. 4), whereas cells separated from blood in the presence of high CsA concentrations exhibited decisively reduced NF-KB binding activity. Specificity of the binding reaction was shown by the competition with unlabeled consensus oligonucleotides (See p. 4236). Holschermann also showed that the administration of CsA to these patients as taught in the prior art PDR 1985 and Griffith I and II references reduced Tissue Factor (TF) gene transcription, which is recognized as being regulated by NF- κ B: "Indeed, the marked activation of the NF- κ B transcription factor, which is known to play a major role in the regulation of the TF gene, was prevented in the presence of high CsA blood concentrations." Id. at 4237. Thus, Cyclosporin A, as administered in the prior art PDR 1985 and Griffith I and II references:

- a. regulated (inhibited) expression of a gene whose transcription is regulated by NF- κ B and;
- b. regulated (diminished) transduction in a cell of an extracellular signal mediated by NF- κ B. See MPEP 2131.01 (evidence of inherency).

With regard to claims 89-90, applicants essentially recite the same invention as recited in claims 66-68, i.e. a method for regulating (i.e. reducing) expression of a NF- κ B regulated gene (the expression of which has been induced by any external influence that activates NF- κ B to act as a intracellular messenger) by inhibiting transmission of the NF- κ B mediated signal so as to reduce expression of the gene in the cell. The cell is defined as being a human cell.

PDR (1985), Griffith I and, Griffith II teach a method for reducing expression in human PBM cells of genes (such as TF) the expression of which has been induced by

Art Unit: 1636

any of the external influences that normally activate NF- κ B to act as an intracellular messenger to transmit a signal that induces expression of the gene from the plasma membrane of the cell to the nucleus of the cell, which method comprises within the cell inhibiting transmission of the signal by administering CsA, wherein said CsA inhibits transmission of the signal by reducing NF- κ B activity, thereby inhibiting transmission of the signal and thereby reducing expression of the gene.

Claims 66-67, 69 and 70 are rejected under 35 U.S.C. 102(b) as being anticipated by Gescher et al. or Hunter et al.

Applicants claim a method of regulating NF- κ B-mediated gene expression in a cell, comprising altering NF- κ B activity in the cell and a method of regulating transduction in a cell of an extracellular signal by NF- κ B, comprising altering NF- κ B activity in the cell, wherein NF- κ B activity is enhanced. Applicants also claim a method of regulating NF- κ B-mediated expression of a selected gene in a cell, comprising introducing into the cell a substance which regulates NF- κ B activity in the cell.

It is noted that administration of phorbol esters such as 12-O-tetradecanoyl-phorbol-13-acetate (TPA) to human cells (such as A549 and A431 cells) inherently induces (enhances) NF- κ B activation (See for example, Kang et al., Cell. Mol. Life Sci., 2005, Vol. 62, pp. 1146-1155 and Jang et al., Biochem. Biophys. Res. Comm., 2005, Vol. 328, pp. 70-77). Kang et al. teaches that TPA augments the promoter activity of the AR gene via the activation of NF- κ B and protein kinase while Jang et al. teaches that TPA induced TLR2 gene expression via NF- κ B activation.

Gescher et al. (Cancer Research, September 1985, Vol. 45, pp. 4315-4321, see whole article, particularly the Abstract and pp. 4316-4317) teaches administration of TPA (10^{-8} M) to human A549 cells, wherein said administration inherently enhances NF- κ B activity and Hunter et al. (Nature, 1984, Vol. 311, pp. 480-483, see whole article, particularly the Abstract and Fig. 1) teaches administration of TPA (100 ng/ml) to human A431 cells, wherein said administration inherently enhances NF- κ B activity and therefore the expression of genes induced by binding of NF- κ B (i.e. TLR2 and AR). Gescher et al. and Hunter et al. therefore teach the claimed invention.

Claims 71-72 are rejected under 35 U.S.C. 102(b) as being anticipated by Pasleau et al.

Applicants claim a method of positively regulating NF- κ B-mediated gene expression in a cell, comprising: a) introducing into the cell a gene construct comprising a gene of interest, a DNA sequence which is the binding site of NF- κ B and a promoter for the gene; and b) maintaining the cell under conditions appropriate for expression of the gene. The binding site is represented by the following consensus sequence:

C C
GGGRATYYAC or equivalents thereof.
T T

It is noted that the CMV IE promoter/enhancer has several NF- κ B binding sites and is subject to regulation by NF- κ B (See, for example, Lee et al., Eur. J. Biochem., 2004, Vol. 271, pp. 1094-1105, see especially Fig. 1). The NF- κ B binding site consensus sequence is represented in the CMV promoter/enhancer.

Pasleau et al. (Gene, June 1985, Vol. 38, pp. 227-232, see whole article, particularly the Abstract, Fig. 1 and p. 230) recites introducing into the cell a gene construct comprising a gene of interest (bovine growth hormone gene, bGH), a DNA sequence which is the binding site of NF- κ B and a promoter for the gene (CMV IE promoter/enhancer) and maintaining the cell under conditions appropriate for expression of bGH. Pasleau et al. therefore teaches the claimed invention.

Claims 71-73 are rejected under 35 U.S.C. 102(b) as being anticipated by Cullen.

Applicants claim a method of positively regulating NF- κ B-mediated gene expression in a cell, comprising: a) introducing into the cell a gene construct comprising a gene of interest, a DNA sequence which is the binding site of NF- κ B and a promoter for the gene; and b) maintaining the cell under conditions appropriate for expression of the gene. The binding site is represented by the following consensus sequence:

 C C
GGGRATYYAC or equivalents thereof and wherein the consensus sequence is present
 T T
in the HIV LTR.

Cullen (Cell, Sept. 1986, Vol. 46, pp. 973-982, see whole article, particularly the Abstract; "Results" section on pp. 973-974; Tables 1-2) recites introducing into a cell a gene construct comprising a gene of interest (human interleukin-2, IL-2), a DNA sequence which is the binding site of NF- κ B and a promoter for the gene (HIV LTR) and maintaining the cell under conditions appropriate for expression of IL-2. Cullen therefore teaches the claimed invention.

Art Unit: 1636

Claims 71-72 are rejected under 35 U.S.C. 102(b) as being anticipated by Banerji et al. (Cell, 1981, Vol. 27, pp. 299-308) or Humphries et al. (Cell, 1982, 1982, Vol. 30, pp. 173-183).

Applicants' invention is as described above.

Humphries et al. (See whole article, particularly the Abstract ; Fig. 1; pp. 179-180) and Banerji et al. (See whole article, particularly the Abstract; Figs. 1 and 4; pp. 302-304) both recite introducing into a cell a gene construct comprising a gene of interest (β -globin or α -globin or δ -globin genes), a DNA sequence which is the binding site of NF- κ B (in the SV40 enhancer) and a promoter for the gene and maintaining the cell under conditions appropriate for expression of IL-2. Cullen therefore teaches the claimed invention. Applicants indicate in the instant specification (see for example, pages 74, 83 and Table 2) that the SV40 enhancer has NF- κ B binding site(s). Banerji et al. and Humphries et al. therefore teach the claimed invention.

Statutory Double Patenting

A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

Art Unit: 1636

Claims 66-73 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 66-73 of copending Application No. 10/037,415. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Obviousness Type Double Patenting Rejections

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 66-68, 70 and 89-90 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-5, 9-17, 20-63, 88-176 and 192-203 of U.S. Patent No. 6,410,516 (hereafter the '516 patent). Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims read on methods of regulating NF- κ B mediated gene

Art Unit: 1636

expression in a cell, comprising altering (inhibiting) NF- κ B activity in the cell. The instant claims are generic to the claims recited in the '516 patent. That is, the recited claims of the '516 patent fall entirely within the scope of the instant claims, or in other words, the instant claims are anticipated by the claims of the '516 patent. For example, the various methods for inhibiting expression of NF- κ B mediated gene expression in cells recited in the '516 patent are encompassed within the instant broad methodologies (i.e. the instant methods encompass any method of regulating NF- κ B mediated gene expression in any cell). With regard to instant claims 89-90, these claims are likewise generic to the claims in the '516 patent in that they recite methods for reducing expression of any NF- κ B mediated gene(s) in human cells by inhibiting the transmission of signals, mediated by NF- κ B as a consequence of some external influence, which induce expression of said genes.

Claims 89-90 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 66, 68 and 89 of copending Application No. 10/037,415 (hereafter the '415 application). Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims recite the same methods of reducing expression in cells of a gene whose expression is modulated by NF- κ B. The instant claims are generic to the claims in the '415 patent in that the instant claims recite a method for reducing expression of a NF- κ B inducible gene in a human cell comprising inhibiting transmission of the signal (induced by NF- κ B activation from any external influence) that induces

Art Unit: 1636

expression of the gene in the cell. Claim 89 in the '415 application recites the same claim with the exception that the external influence that activates the NF- κ B is a polypeptide. With regard to claims 66 and 68 of the '415 patent, these claims also recite a method of regulating NF- κ B mediated gene expression in a cell comprising reducing NF- κ B activity so that the signal transmitted through NF- κ B activity is reduced; this is also a species of the instant claims. With regard to the instant claims reading on human cells, it is noted that claim 89 of the '415 application reads on human cells, and the specification of the '415 application specifically contemplates human cells as a preferred embodiment and hence human cells would have been an obvious choice as the cell for use in the instant methods.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

No Claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Guzo, Ph.D., whose telephone number is (571) 272-0767. The examiner can normally be reached on Monday-Thursday from 8:00 AM to 5:30 PM. The examiner can also be reached on alternate Fridays.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, Joseph T. Woitach, Ph.D., can be reached on (571) 272-0739. The

Art Unit: 1636

fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David Guzo
April 14, 2007


DAVID GUZO
PRIMARY EXAMINER